Operation of Air Samplers without Flow Measurement Capability

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BIENNIEL REVIEW

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SOP REVISIONS

Rev. No.	Rev. Date	Revision	Responsible Official
0	June 2009	Conversion of SOP CER-201	M. Sells
1	June, 2011	Title change, Reformat RIE-101 R5 format, Revisions to sampling methods	M. Sells

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1.0 PURPOSE

This SOP describes the methods and requirements for both routine field and emergency response operation of air samplers that do not have electronic flow control or flow monitoring capability. R&IE currently uses several types and models of air samplers from different manufacturers. The samplers vary in flow rate and media size and can be used in a variety of sampling situations including long or short term sampling projects and for emergency response activities.

Emergency response air sampling for radionuclides that are described in this procedure will most likely occur after the emergency phase operations of the emergency has passed. This period of operations is generally referred to the intermediate phase, or post plume phase and is the time frame where detailed characterization of the areas of concern is being performed. Air sampling is important for identifying and quantifying resuspension of material deposited during this phase.

2.0 SCOPE AND APPLICATION

2.1 Scope and Application

The procedure applies to air sampling equipment that does not have a means of electronic flow measurement or control. Procedures for this type of air sampler require flow measurements using external devices to accurately measure flow rates prior to and at the end of sample period

This procedure describes the proper setup, flow measurement and operation of this type of samplers used to collect particulate and radioactive iodine samples. Methods for sample collection, handling, quality control, and documentation are included. Additionally, some basic field analysis techniques that may be considered in emergency response situations are also discussed.

This procedure applies to the operation of air sampling equipment used by the Radiation and Indoor Environments National Laboratory (R&IE). This includes implementation of routine or unique laboratory projects that require particulate air sampling, and potential emergency response activities performed by the Radiological Emergency Response Team (RERT).

This version of CER-205 – Rev. 1 replaces CER-205 – Rev. 0, Operation of Standard High and Low Volume Air Samplers.

2.2 Interferences

N/A

2.3 Potential Problems

Contamination control procedures and decontamination procedures are not described here and must be considered when collecting samples in a radiological emergency.

3.0 DEFINITIONS

ALARA: As Low As Reasonably Achievable

CERMER: R&IE, Center for Environmental Restoration, Monitoring and Emergency Response

CFM: Cubic Feet per Minute

CRQA: R&IE, Center for Radioanalysis and Quality Assurance

FMD Flow Measuring Device

inHg.: Inches of mercury

MERL: Mobile Environmental Radiation Laboratory

OJT On the Job Training

SCFM Standard Cubic Feet per Minute – Flow rate in CFM corrected to STP conditions

STP: Standard Temperature and Pressure, reference to sea level (20 degrees C @ 29.92 inHg.)

QAC: Quality Assurance Coordinator

4.0 PERSONNEL

4.1 PERSONNEL QUALIFICATIONS

4.1.1 All new field personnel will be provided with training courses in air sampling equipment and collecting environmental samples. If training courses are not readily available, all new personnel will learn and perform these procedures under the direct supervision of an experienced field sampling technical expert. Documentation of formal training shall be maintained by the RIE Training Coordinator. Form RIE101-004F "Worker On the Job Training (OJT) Qualification Form" shall be used to document on the job training and copies of the form presented to the Center QAC for archive.

4.1.2 All experienced personnel will provide management with certificates from courses specific to collecting environmental samples and air sampling equipment or provide project specific work experience. In addition, they will be provided with refresher courses in air sampling equipment and in environmental sampling biennially or when procedures are modified or changed.

4.1.3 All Users must have a sound understanding of the mechanical function of air samplers as well as a basic knowledge of electricity and related hazards or perform work under the direct supervision of qualified personnel.

4.1.4 Personnel using air sampling equipment in an emergency response must be familiar with field monitoring instrumentation and techniques used for evaluation of particulate air samples for determination of airborne particulate.

4.1.5 Field personnel must be familiar with decontamination (decon) procedures, and the methods used to avoid cross contamination of samples.

4.2 PERSONNEL RESPONSIBILITIES

4.2.3 All personnel who collect environmental samples are responsible for following the requirements put forth in the Health and Safety Plan for the project or incident. Each person must follow ALARA principles and be aware of exposure and dose turn back levels set for the project.

4.2.4 The field Team Supervisor and Monitoring Manager shall ensure that field teams assigned to collect samples in a potentially contaminated area have access to information about the areas of deposition of radioactive materials so that teams can avoid unnecessary exposure by avoiding contaminated areas wherever possible.

4.2.4 All personnel who collect environmental samples are responsible for following the procedures and quality assurance requirements described within this SOP and to be aware of and comply with site specific regulations and quality assurance protocols..

4.2.5 All personnel who collect samples using this procedure are responsible for completing all documentation associated with the sample, and ensuring that all forms are complete and correct prior to transfer of the sample out of their custody.

5.0 EQUIPMENT AND SUPPLIES

- Air sampler and appropriate filter holders
- Borosilicate Glass fiber 2" and 4" diameter DOP penetration < 3%
- TEDA impregnated Charcoal Type C cartridge or Silver Zeolite Type C AgZ cartridge
- Forceps
- Field log book
- Latex gloves
- Glassine envelopes
- Small Philip screw driver
- 4" x 4" sealable bags
- Sample Control Form (Example, Attachment 17.1)
- Chain-of-Custody Form (Example, Attachment 17.2)
- Generator (Optional, to power air sampling equipment)

6.0 REAGENTS AND STANDARDS

N/A

7.0 HEALTH AND SAFETY

7.1 Health Cautions

7.1.1 A tailgate briefing will be conducted and documented by the Field Monitoring Manager or designee each day prior to performing sample collection or monitoring activities.

- The briefing will include all health and safety issues that are addressed in the Health and Safety Plan (HASP) for the event/project.
- All personnel attending the briefing will sign the appropriate attendance form.
- A copy of the HASP will be made available to all personnel at their request.

7.1.2 Always wear all Personal Protective Equipment (PPE) as required by the HASP or other H&S site or project specific requirements during field monitoring and sampling operations.

7.1.3 Field projects encompass a wide range of other hazards. Precautions should be followed while performing surveys including the buddy system, line of site operations, and maintaining communication with others. The site HASP shall be reviewed and followed.

7.1.4 Special handling may be required for samples with radioactivity greater than background.

- Any samples that have gamma exposure rates above 1 mR/hr at one foot should be stored in a shielded container in the field team vehicle.
- If sample exposure rates are greater than 2 mR/hr at one foot, contact the RSO or the Field Team Supervisor for further instructions regarding handling of the sample.
- All attempts should be made to protect the vehicle occupants from exposure using ALARA principles.
  - Shield occupants by covering hot samples with other samples or items to act as shielding.
  - Place the samples as far from the occupants as possible in the vehicle.
  - Transport and process the samples as quickly as possible to reduce any exposure time to the occupants of the vehicle.
- Always inform personnel accepting transfer of samples (sample control or courier for example) of samples with elevated levels of radioactivity or contamination.

7.2 Equipment Cautions

7.2.1 Always verify that electrical equipment is grounded properly.

7.2.2 Do not remove electrical equipment housings or covers, or otherwise expose internal operating parts. If equipment is not operating properly or makes odd or excessive noise, return the item for maintenance.

8.0 SAMPLE COLLECTION PRESERVATION, AND STORAGE

N/A – Since this procedure is a sample collection procedure, these topics are discussed in the procedural section of this SOP and in SOP CER-220.

9.0 CALIBRATION AND STANDARDIZATION

9.1 Air Samplers

9.1.1 The samplers used in this procedure do not require calibration.

9.1.2 All air samplers used in this procedure shall receive biennial preventative maintenance. Maintenance shall be performed and documented according to SOP CER-405.

9.1.3 If an air sampler is placed into a field sampling location, a label identifying the maintenance due date, one calendar year from placement, shall be attached to the face of the sampler. If the sampler is never placed in the field the label identifying the maintenance due date will be two calendar years from placement.

9.1.4 The sampler is to be returned for maintenance prior to the expiration of the maintenance due date.

9.2 Flow Measurement Devices

9.2.1 All flow measurement devices must be calibrated annually.

9.2.2 Secondary reference calibration of flow measurement devices manufactured by F&J Specialty products, including D814, D-812, and D870 versions used by R&IE may be performed using a F&J Model FC-100 Calibrator.

- FC-100 calibrator must have been calibrated against a primary calibration source by the manufacturer within the previous 12 months.

- Calibration is performed using F&J calibration software in conjunction with the FC-100 to adjust the barometric and differential pressure sensors and the thermistor temperature sensor in the flow measurement device. Refer to SOP CER-410 for the FC-100 calibration procedure.

9.2.3 All other brand devices used by R&IE shall be returned to the manufacturer for calibration annually.

10.0 PROCEDURE

10.1 General practices

When deploying an air sampler general guidelines are to be followed. These common practices are standard for all air samplers without flow measurement capability.

10.1.1 Verify that the sampler maintenance label indicates that the sampler has been inspected within the previous 24 months for operability. Return the sampler to the appropriate maintenance facility if the label is out of date.

10.1.2 Place the sampler in a location that will not be influenced by structures or trees that will interfere with air movement in the area. If possible, samplers should be placed in an open area at distance of at least two times the height of the obstruction.

10.1.3 Use a generator if sampling in locations where power is not available. Follow all health and safety guidelines when using power generating equipment. Reference SOP CER-309, "Operation of Portable Generators", if needed.

10.1.4 Route the sampler power cord so that it does not create a trip hazard. Tie up excess cord to prevent interference with supplies or other equipment.

10.1.5 Verify that the sampler intake is clean and free of debris before attaching sample head or installing the sampling media.

10.1.6 Ensure that the sampler is securely anchored to the tripod or support stand. If possible, the sample inlet should be placed at breathing zone height, five feet above the ground.

10.1.7 Point the sample head in a downward direction if possible, to reduce the potential for the sampler to draw water into the pump in the event of rain. Use a rain-hat or other protection if available.

10.1.8 Always assume that sample media (filter/cartridge) is contaminated, and must be handled accordingly. Always use forceps to manipulate filters and wear appropriate PPE when handling samples and sampling equipment

10.1.9 Filters may need to be monitored for radioactivity during emergency response activities. Some general guidelines to follow:

- Use a counting jig to count filter media with a FIDLER detector. The jig is used to maintain similar geometry while counting filters. Typical use of FIDLER detectors will be to evaluate 4" filter media in a plutonium release or event.

- Count β/γ using a pancake detector placed directly on the glassine envelope, over the filter.
- Use count times and detector geometry as directed by the control point.
- Several timed counts may be required to estimate interference from radon daughters as they decay over time.
- For repeated counts, the elapsed time (decay time) is the time between the time that the air sampler was turned off and the beginning of the counting period.
- Always take care not to contaminate the detector by touching it to the filter media.

10.2 Starting a **low** or **medium** volume air sample using 2" filter media

Typical two-inch media samples are collected using a standard open-face combination sample head (filter holder) using 2" fiber filter in combination with a 'Type C' charcoal or zeolite cartridge (optional).

Two-inch sample media are used to collect both low volume (2-3 SCFM – up to 168 hours) and medium volume (6-15 SCFM – 12 to 36 hours) samples.

RaDeco™ samplers employ a quick connect attachment to connect the filter head to the sampler input. Medium volume sampling uses a hi-volume sampler (HV-1SH, CF-903) with a 4" to 1.83" NPT adapter. The sample head shown in ***Figure 1*** has a 1.83" threaded base.

Figure 1: 2" Filter Holder

An adapter is used to connect the filter holder to a flow measuring device, as described in section 10.4 of this procedure.

10.2.1 Disassemble the filter holder by removing the filter lock ring and separating the cartridge chamber cover from the base (***Figure 2***).

Figure 2: 2" Filter Holder, disassembled

10.2.2 Insert a charcoal or zeolite cartridge into the chamber, assuring that the direction of flow indicated on the cartridge is correct.

10.2.3 Re-attach and secure the cartridge cover to the filter head base.

10.2.4 Using forceps install a new glass-fiber filter. Rough, fibrous side should face outward, and the filter should fit snugly in the shallow grove in the cylindrical section of the sample head.

10.2.5 Reinstall the filter lock ring, and attach the sample head to the air sampler.

10.2.6 Check operation of the sampler.

- Turn on the air sampler and allow for the flow to stabilize.
- Set the flow rate to maximum on the HV-1SH and CF-903 medium volume samplers.
- Check the gauge readings on the RaDeco style samplers.
  - The Pump Head gauge should read between 10 and 15 inHg.
  - The Filter head (ΔP) gauge should read between 0 and 5 inHg.

NOTE: If the ΔP is greater than 5 inHg, it is likely that the filter is plugged or there is a mechanical problem restricting the air flow. The unit should be returned for maintenance if the source of the blockage cannot be determined.

10.2.7 Turn off the sampler and perform a Flow Rate Determination as per section 10.5 of this procedure.

10.2.8 Restart the sampler and zero the sample timer.

10.2.9 Initiate a Sample Control Form, annotating the sampling information and the start date and time of the sample.

10.2.10 Initiate a Chain-of-Custody form for the sample

10.2.11 Place or store the SCF and COC form in a location that will be available to the person(s) who will collect the sample(s). This may require leaving the forms at the sampling location. If forms are left at the sampling location, duplicate sampling information should be entered in a field logbook in case the documents are lost or stolen.

10.3 Starting a **high** volume air sample using 4" filter media

Four-inch sample media are used to collect short term High Volume air samples. Air samplers are generally set to the maximum flow rate, typically 35 – 50 SCFM. Samplers are usually operated at this rate for 12 to 48 hours to obtain sufficient volume of sample needed to evaluate for most airborne radionuclides with a minimum laboratory count time.

High volume samplers used for the collection of particulates on 4" media are the F&J model HV-1SH, Hi-Q model CF-903, and F&J model T-8400. All three types of sampler employ the same method of mounting for the filter media consisting of a support screen or base with a threaded filter hold-down ring.
For flow rate determination, the hold-down ring is replaced with an adapter for connection to the FMD. The sample filter remains in place during the flow rate determination. This process is described in section 10.4.

10.3.1 Attach the sampler to a medium/heavy duty tripod and adjust the sampler intake to approximately five feet above the ground, breathing height.

10.3.2 Set the flow rate switch on the sampler to Maximum.

10.3.3 Perform an initial flow rate determination per section 10.5 of this procedure, with the sample filter in place.

10.3.4 After initial flow rate determination is made, record the value on the Sample Control Form for the sample as the initial flow rate in SCFM.

10.3.5 Assure that the filter is held in place by the filter lock-ring.

10.3.6 Restart the sampler and zero the sample timer.

10.3.7 Initiate a Sample Control Form, annotating the sampling information and the start date and time of the sample.

10.3.8 Initiate a Chain-of-Custody form for the sample

10.3.9 Place or store the SCF and COC form in a location that will be available to the person(s) who will collect the sample(s). This may require leaving the forms at the sampling location. If forms are left at the sampling location, duplicate sampling information should be entered in a field logbook in case the documents are lost or stolen.

10.4 Sample collection

Prior to field deployment to collect air samples, assure that you have all associated documents related to the sample, including the SCF and COC for the sample. Some samples will have the

associated paperwork attached to the sampler or tripod when the person collecting the sample is different from the person who initiated the sample.

10.4.1 Verify that the SCF and COC are complete with the sample start information.

10.4.2 Annotate the SCF with the sample stop date and time, in addition to the collection date and time. (unique for air sample collection on the SCF)

10.4.3 Turn off the air sampler and perform a flow rate measurement for the ending flow rate per section 10.5.

10.4.4 Particulate filter collection

- Taking care not to disturb particulates that have been collected, remove the glass-fiber filter from the filter holder using forceps.
- Insert the filter into a 5" x 7" glassine envelope and fold the top of the envelope to prevent loss of any loose material that may become dislodged from the filter.
- Place the glassine envelope containing the filter into a 6" sealable plastic bag.
- Place the sealed plastic bag containing the filter, along with the yellow copy of the completed Sample Control Form into a large (10 - 12 inch) sealable plastic bag while making sure that the form is facing outward so it can be read without removing it from the sealed bag.

10.4.5 Charcoal cartridge collection

- Remove the charcoal cartridge.
- Carefully seal the charcoal cartridge in a 4" x 4" sealable bag.
- Place the bag containing the cartridge along with a copy of the completed Sample Control Form into a large, sealable plastic bag while making sure that the form is facing outward so it can be read without removing it from the sealed bag.

10.4.6 Keep the filter and cartridge together as a sample set, using the same Chain-of-Custody Form for both samples.

10.4.7 Secure and transport the sample(s) to the appropriate sample control point, or if a routine sample, transport to the CRQA Sample Control Laboratory.

10.4.8 Assure that the sample is maintained under secure custody until the sample is transferred along with the Chain-of-Custody Form to sample control or laboratory personnel.

10.5 Flow Measurement Determination

10.5.1 Use ***Table 1*** below to determine the model of Flow Measuring Device (FMD) and adapter required to determine the flow rate for the sampler type and media size.

10.5.2 Turn on the FMD and allow 5 to 10 minutes for the electronics to warm up.

10.5.3 Verify that the FMD display defaults to 0.00 SCFM. If the display does not indicate 0.00 at this time, do not use the FMD and return it for evaluation.

10.5.4 Attach FMD adapter to the air sample inlet using the appropriate adapter as required.

- The adapters listed in ***table 1*** to connect the D-812, D-814, AFC-14, and HVC-2 flow measuring devices to the two-inch filter holders are designed to attach directly to the filter holder assembly when the filter hold down ring is removed.
- Carefully keep the filter in place when attaching the adapter to the filter holder.

TABLE 1

Sampler Model	Filter Media Size	FMD Model	Adapter P/N	Expected Flow Rate
RaDeco Style	2"	D-812 or D-814	F&J - ADPCAL	2 – 3 SCFM
		AFC-14	Hi-Q - CFA-20-CA	
		HVC-2,	BGI - 3114	
HV-1SH, CF-903	2"	D-814	F&J - ADPCAL	5 – 14 SCFM
		AFC-14	Hi-Q - CFA-20-CA	
		HVC-2	BGI - 3114	
HV-1SH, CF-903, T-8400	4"	D-870	ADP-40A	25 – 50 SCFM
		AFC-50	None	
		HVC-2	None	

- Refer to ***figures 3 through 10*** below when using this type of adapter.

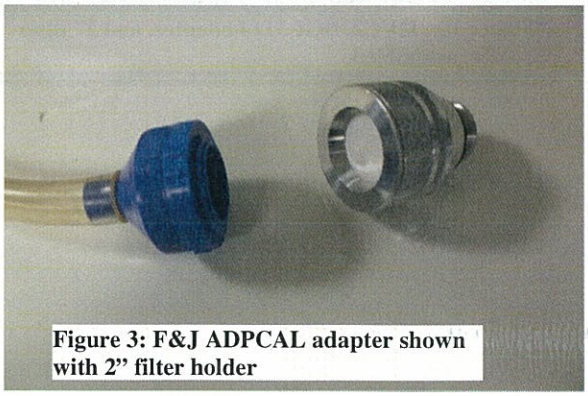

Figure 3: F&J ADPCAL adapter shown with 2" filter holder

Figure 4: F&J ADPCAL adapter shown with 2" filter holder attached

Figure 5: AFC-14 FMD, CFA-20-CA adapter, and 2" filter head with hold down ring removed

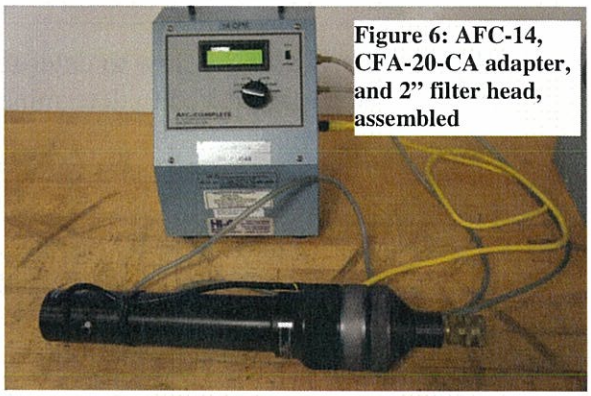

Figure 6: AFC-14, CFA-20-CA adapter, and 2" filter head, assembled

Figure 7: F&J HV1SH (High/Med Volume) Sampler with D-814 FMD, ADPCAL adapter

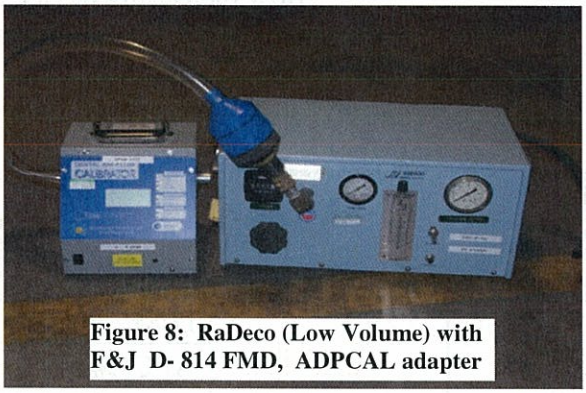

Figure 8: RaDeco (Low Volume) with F&J D- 814 FMD, ADPCAL adapter

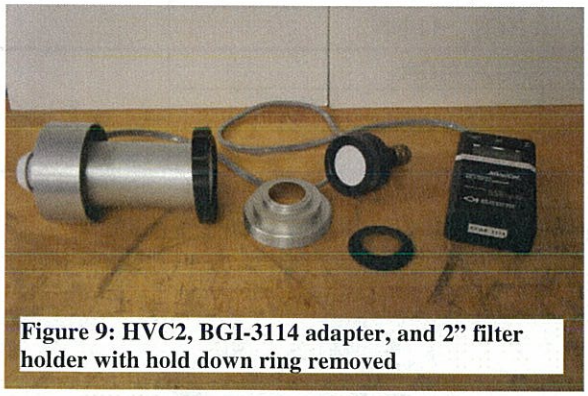

Figure 9: HVC2, BGI-3114 adapter, and 2" filter holder with hold down ring removed

Figure 10: HVC2, BGI-3114 adapter, and 2" filter holder, assembled

- Four-inch samplers have a filter hold-down ring that attaches directly to the sampler. The FMD is attached by replacing the hold-down ring with a threaded adapter or by direct attachment of the FMD venturi to the sampler. Keep the sample filter is in place when attaching the sampler to the FMD.

- Refer to figures 11 through 14 when using 4" high volume samplers.

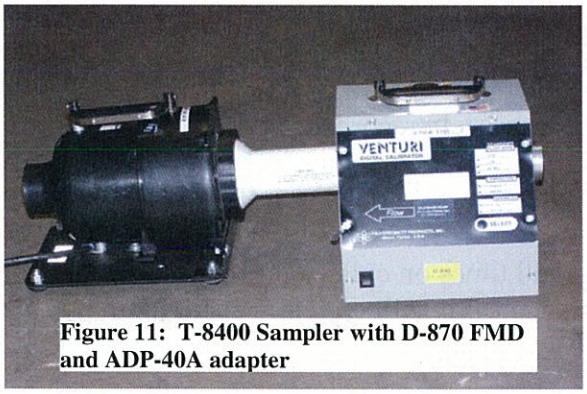

Figure 11: T-8400 Sampler with D-870 FMD and ADP-40A adapter

Figure 12: HV-1SH Sampler with D540 FMD and ADP-40A adapter

Figure 13: HVC-2 Venturi attached directly to CH-903 sampler, 4"

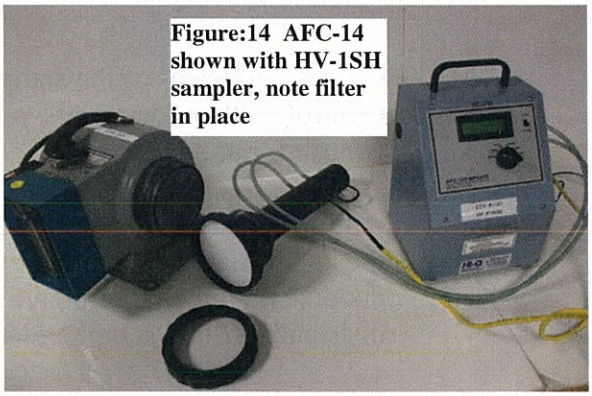

Figure:14 AFC-14 shown with HV-1SH sampler, note filter in place

10.5.5 Assure that the FMD is set to display values in "inHg" for pressure measurements, "°F" for temperature measurements, and "SCFM" for flow rate measurements.

10.5.6 Verify that the direction of airflow through the FMD is correct, according to the indicator on the front of the device.

10.5.7 Turn on the air sampler and allow the sampler flow rate to stabilize.

10.5.8 Observe the displayed flow rate value and note the highest and lowest values over a period of about 1 minute. Average the observed high and low values and record the average as the initial (or ending) flow rate for the sample on the Sample Control Form.

10.5.9 Turn off the air sampler and the FMD, and disconnect the units, and re-attach the filter hold-down ring to the sampler or filter holder.

11.0 QUALITY ASSURANCE

11.1 Quality Control

11.1.1 Identify quality control samples that are collected using separate SCFs.

11.1.2 Annotate the SCF of both the original sample and the QC sample to identify the sample number of the associated sample.

11.1.3 All data related to where the sample was collected, how it was collected, and how long it was collected, is essential and must be accurately recorded.

11.2 Records Management

11.2.1 Chain-of-Custody will be maintained at all times on collected samples until samples are submitted to the Laboratory. Field team custody will typically end with transfer to Sample Control.

11.2.2 All original Sample Control Forms must be kept with the sample for submission to the Laboratory.

11.2.3 Copies/duplicates of the sample forms are to be delivered with the samples to Sample Control. Other documents generated by the field team are also to be delivered to sample control for archive.

11.2.4 Sample Control will be responsible for delivery of documents generated by field teams to the appropriate documentation unit for the incident management organization. The documentation unit will have the responsibility for final disposition, archive, or distribution of all sample related documentation.

11.2.5 Field teams shall have access to copies of forms and records that have been submitted to Sample Control, upon request.

11.3 Data Verification

11.3.1 Field teams are responsible for review all sample documentation prior to submission of samples to Sample Control. Ensure that all Sample Control Forms and Chain-of-Custody forms are complete and correct and that exposure rate and contamination control information is entered in the proper location on the SCF.

11.3.2 Field teams are responsible for assuring that samples are properly packaged and all of the appropriate labels are attached and are consistent with the Sample Control Form for each sample.

11.3.3 Further review of data for completeness, comparability, representativeness and accuracy will be performed at all stages of sample handling, with final reviews performed by FRMAC Assessment Group or the ICS Planning Section or Environmental Unit that is responsible for the data validation process.

11.4 Computer Hardware and Software Management

There are no specific requirements in place for the management of computer hardware or software associated with environmental sampling at the time of this writing. Some federal organizations are in the process of transition to computer based documentation for recording data and will require management processes to be defined when the programs are established.

11.5 Procurement Requirements

11.5.1 Minimum specifications for filters used in this procedure:

- Borosilicate glass fiber 2.0 M
- 2" and 4" diameterDOP penetration < 3%

11.5.2 Minimum specifications for Charcoal cartridge used in this procedure:

- 2¼ x 1 inch TEDA impregnated carbon cartridge
- minimum 8 x 16 mesh carbon
- Unexpired shelf life (10 years in sealed package)

11.5.3 Minimum specifications for Silver Zeolite (AgZ) cartridge used in this procedure:

- Sealed 2¼ x 1 inch AgZ cartridge
- Minimum 30 x 50 mesh zeolite
- Unexpired shelf life (10 years in sealed package)

11.6 Assessments

11.6.1 This SOP shall be reviewed at least once every two calendar years to assure that the guidance offered is appropriate and comprehensive.

11.6.2 This document must reflect the quality requirements for all organizational parts of R&IE. If changes to the organizational structure of R&IE occur, this document must be reviewed and revised to reflect those changes.

11.7 Nonconformance and Corrective Actions

If a procedural non-conformance is discovered or one occurs due to unforeseen circumstances, the non-conformance issue must be documented using Form RIE101-003F, "R&IE Quality Action Report." Follow the process for disposition and resolution of the corrective action as described on the back of the form and also in SOP R&IE-101.

12.0 DATA ANALYSIS AND CALCULATION

N/A

13.0 DATA REVIEW

Several methods can be used to evaluate the correctness of the displayed data in the field. The following methods for cross-checking data are valuable tools that can be used to verify that the data is recorded correctly and the equipment is running as expected.

- Always double check recorded data for accuracy and possible recording errors prior to re-setting the displays on the sampling equipment.

- Compare the elapsed time counter with the estimated difference in hours between the start date/time and the stop date/time values. The elapsed time counter should be accurate to less than two-tenths of one hour in a week long sample.

14.0 METHOD PERFORMANCE

Air samplers should be operated on a cycle that assures that the required minimum detection limits are achievable. These values should be predetermined based on the radionuclide in question, the detection limits achievable by the laboratory performing the analysis, therefore allowing for the determination of the minimum required sample volume.

15.0 ENVIRONMENTAL MANAGEMENT SYSTEM

15.1 Pollution Prevention

Field teams will not dispose of or abandon used sampling equipment in the field, including any items that may become contaminated through routine usage, or any preservatives or empty containers for storage or transport of chemicals used for preservation of samples.

15.2 Waste Management

All waste materials generated in the field will be segregated and disposed of at the contamination control line upon return of the field team to the support facilities according to the appropriate hotline protocol and procedures.

16.0 REFERENCES

16.1 Specifications and Requirements

- ORIA-R&IE Quality Management Plan, Revision 2, 2006

- Specifications and Guidance for Quality Systems for Environmental Data Collection and Environmental Technology Programs, ANSI/ASQC E4-2004

16.2 Guidance Documents or other special references

- Operation and Maintenance Manual Constant Flow (K-Flow) Air Sampler Model HD-28A, RaDeco, LLC Rev 070906 2001-2006
- High Volume Air Sampler Model HV-1SH Technical Manual, F&J 2008
- High Volume Air Sampler H8400 and T8400 Technical Manual, F&J Rev: 15 2008
- Technical Manual for F&J Portable High Volume Air Samplers, F&J Rev: 15 2008
- CER-405 R0, "Maintenance of Low Volume Air Sampler", Center for Environmental Restoration, Monitoring, and Emergency Response, Draft, June 2011
- CER-220 R1, "Environmental Sampling Procedures", Center for Environmental Restoration, Monitoring, and Emergency Response, March 3, 2011

17.0 APPENDICES

17.1 Example Sample Control Form

17.2 Example Chain-of-Custody Form

Attachment 17.1 Example, Sample Control Form

SAMPLE CONTROL FORM

Sample Control # 740025

Collection Team #:	Collector's Name:		Home Org:
Location Description:			
Latitude:		Longitude:	
SAMPLE TYPE:			
Air Samples	Sampler Type:		Filter Size & Type:
	Date **ON**:		Time **ON** (24 hr.):
	Date **OFF**:		Time **OFF** (24 hr.):
	Start Flow:		Stop Flow:
Milk Samples	Cow ☐ Goat ☐	Stored Feed ☐ Pasture ☐	Other:
	Milking Date:		Milking Time (24 hr.):
Soil Samples	Area of sample: (cm) x (cm)		Depth of sample: (cm)
	Was vegetation collected with soil sample? Yes ☐ No ☐		
	If Yes, vegetation Sample Control #:		
Water Samples	Surface ☐ Ground/Well ☐	Potable/Tap ☐	Other:
Other Samples	Vegetation ☐ Feed ☐	Produce ☐	Other:
	Describe:		
This Section applies to **ALL** samples			
Collection Date:		Collection Time (24 hr.):	
Total Sample Size (Estimated):		Number of Containers:	
Contact RAD Level:	Units:	Instrument #:	Inst. Type:
Remarks:			
		QC Sample #:	

Shaded Sections for Sample Preparation & Control Use Only	QC Sample Type:								
Laboratory	γ	α/β	Sr	Pu	H^3	Other	Other	Other	Other

Contamination Check ☐	Sample Control Initial:	Validated By:
Sample Control & Sample Preparation Comments:		

4135RptE08 Revision Date March 2011

Original with Sample **Yellow Copy to Data Center** **Pink Copy to Sample Control**

Attachment 17.2 Example, Chain-of-Custody Form

ENVIRONMENTAL PROTECTION AGENCY
Office of Radiation and Indoor Air

RADIATION AND INDOOR ENVIRONMENTS NATIONAL LABORATORY
P.O. Box 98571
Las Vegas, Nevada 89193-8571

CHAIN OF CUSTODY RECORD

PROJECT NO.	PROJECT NAME					NO. OF CONTAINERS							REMARKS
SAMPLERS: *(Signature)*													
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION								

Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date	Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date	Time	Received for Lab. by: *(Signature)*	Date	Time	Remarks:	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

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